

### REMARKS

Claims 1-12 and 22-25 are pending in this application. Claims 1-12, 22 and 23 are rejected. Claims 13-21 are cancelled. Claims 24 and 25 are newly added.

### The Rejections

1. Claims 10-12 are rejected under 35 U.S.C. §102(b) as being anticipated by, or in the alternative under 35 U.S.C. §103(a) as being obvious over, U.S. Patent No. 4,778,943 ("Sun").

The Office Action states:

Sun teaches in column 4 MgO catalyst, used to isomerize butene. Where the examiner has found a substantially similar product as in the applied prior art the burden of proof is shifted to the applicant to establish that their product is patentably distinct not the examiner to show the same process of making, see *In re Brown*, 173 U.S.P.Q. 685, and *In re Fessman*, 180 U.S.P.Q. 324.

Applicants respectfully submit that the catalyst disclosed in Sun is not substantially similar to Applicants' claimed basic metal oxide catalyst. In the first place, applicants' catalyst is a double bond isomerization catalyst, whereas the Sun catalyst is for skeletal isomerization. Even though both may contain a basic metal oxide (e.g., MgO), the catalysts as a whole are substantially different in composition and operation. The Sun skeletal isomerization catalyst would not provide the same results as applicants' catalyst.

As stated in Sun, column 1, lines 10-16, the invention of Sun relates to skeletal isomerization which is accomplished by contacting unbranched or lightly branched olefins with acidic catalysts at elevated temperatures to form branched olefins having the same number of carbon atoms. Sun mentions nothing about the presence or absence of activity-affecting amounts

of water or carbon dioxide. Rather, the Sun catalyst is treated with a halogen source such as halogen acid or ammonium halide. Thus, the Sun catalyst is acidic. However, it is Applicants' goal to eliminate acid sites to prevent fouling reactions which limit the onstream life of the catalyst. See, e.g. Applicants' specification, page 10, lines 17-24. Therefore, the Sun catalyst would not be useful in the process claimed by Applicants. Thus, even though Sun discloses a catalyst containing alkaline earth oxide(s) (e.g., MgO, CaO), the Sun catalyst could not be employed in the double bond isomerization process claimed by applicant, and does not meet the requirements of Applicants' claim.

2. Claims 10-12 are rejected under 35 U.S.C. 102(b) as being anticipated by, or in the alternative under 35 U.S.C. §103(a) as being obvious over, U.S. Patent No. 5, 153,165 ("Lowery et al. '165").

Claim 10 amended herein to recite, *inter alia*, that the catalyst composition for double bond isomerization consists essentially of a basic metal oxide. Lowery et al. '165 is directed to an alkali/alkaline earth metal oxide on a refractory metal oxide support such as silica prepared from a paste including water and acid. Claim 10 as amended substantially excludes materials as components of the catalyst composition which are not basic metal oxides. The Lowery et al. '165 catalyst composition includes a refractory oxide (e.g. silica) support. Lowery et al. '165 does not suggest a catalyst composition which is substantially entirely a basic metal oxide. Moreover, as mentioned above, Applicants' claimed invention is directed to excluding water and acid sites

from the basic-metal oxide catalyst. Lowery et al. '165 never suggests that water or acid sites have any negative effects on catalyst performance. Accordingly, Lowery et al. '165 neither discloses nor suggests applicants' invention. Reconsideration and withdrawal of the rejection of claims 10-12 under 35 U.S.C. §102(b) and/or §103(a) over Lowery et al. '165 is respectfully requested.

3. Claims 10-12 are rejected under 35 U.S.C. §102(b) as being anticipated by, or in the alternative under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 5,134,103 ("Lowery et al. '103").

Claim 10 is amended as discussed above. Lowery et al. '103 is directed to a method of preparing spherical particles containing magnesium oxide and magnesium hydroxide. Lowery et al. '103 teaches that calcining temperature and time should be set up to allow at least 1% by weight of magnesium hydroxide left in the catalyst (Col. 6, lines 5-10). Clearly, the Lowery et al. '103 patent neither discloses nor suggests Applicants' claimed invention, which excludes from the catalyst composition any hydroxides of magnesium. Reconsideration and withdrawal of the rejection of Claims 10-12 under 35 U.S.C. §102(b) and/or 103(a) over Lowery et al. '103 is respectfully requested.

4. Claims 1-7 and 22, 23 are rejected under 35 U.S.C. §103(a) as being obvious over Lowery et al. '103 in view of U.S. Patent No. 5,077,029 ("Schaub").

Independent Claim 1 is directed to a process for activating a basic metal oxide double bond isomerization catalyst using a dry inert gas containing not more than about 5 ppm molecular oxygen. The Office Actions states that Lowery et al. does not teach how the nitrogen was made or its oxygen content, but that Schaub teaches an essentially pure nitrogen.

Lowery et al. '103 states as follows at col. 6, lines 11-13.

After activation, sometimes it is advisable to flush the catalyst with an inert gas to remove any adsorbed oxygen or other gases.

Lowery describes calcining conditions which are adapted to leave at least 1 wt % magnesium hydroxide in the catalyst as a binder. Preferred calcining conditions include a temperature of from 500°C to 575°C for a period of time ranging from 0.5 to 2.0 hours (Col. 4, lines 45-47).

Applicants wish to highlight the fact that Lowery et al. '103 refers to flushing the catalyst with the inert gas after the catalyst has been activated whereas applicants' Claim 1 is directed to contacting the basic metal oxide with a dry inert gas under activation conditions. In dependent Claim 5, the activation conditions are set forth as a temperature of at least about 550°C and a period of time of at least about 6 hours, which is far outside the scope of the Lowery et al. '103 disclosure. Accordingly, Lowery et al. '103 does not disclose activation of the catalyst using dry inert gas having not more than 5 ppm oxygen and is deficient as a reference. Schaub discloses a method for producing highly pure nitrogen but says nothing about catalyst activation using high

purity nitrogen. Even if Schaub were to be combined with Lowery et al. '103 as suggested by the Examiner, applicants' independent Claim 1 would not be disclosed or suggested.

However, applicants further submit that any such combination would be improper. In order for references to be validly combined as to their teachings, there must be objective evidence of record which supports such a combination. There must be a showing of a suggestion, teaching or motivation in the prior art for combining the prior art references to preclude impermissible hindsight reconstruction of the invention based upon applicants own disclosure. See, e.g., In re Lee, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002) which states in part:

The need for specificity pervades this authority. See, e.g. In re Kotzab, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000) ("particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the matter claimed");...

In the present case, the examiner's statement that using the pure nitrogen of Schaub in the process of Lowery is an obvious expedient is conclusory and not supported by the references. Nothing in Lowery et al. '103 or Schaub discloses or suggests the criticality of using nitrogen with an oxygen content of no more than 5 ppm for activation of a basic metal oxide olefin double bond isomerization catalyst. Nothing in Lowery et al. '103 or Schaub suggests the advantage of removing substantially all traces of water and carbon dioxides with respect to long term catalyst activity. Accordingly, independent Claim 1 and all claims depending therefrom are submitted to be patentable over the cited prior art references. Reconsideration and withdrawal of the rejection

of Claims 1-7 and 22, 23 under 35 U.S.C. §103(a) over Lowery et al. '103 and Schaub are respectfully requested.

4. Claims 8 and 9 are rejected under 35 U.S.C. §103(a) as being obvious over Lowery et al. '103 taken with Schaub and further in view of U.S. Patent No. 5,003,118 ("Low et al.") and U.S. Patent No. 5,573,988 ("Didillon").

Claims 8 and 9 depend from Claim 1, which is submitted to be patentable for the reasons stated above. Accordingly, Claims 8 and 9 are also submitted to be patentable.

Moreover, both Low et al. and Didillon are not relevant to the present claimed invention. Low et al. is directed to skeletal isomerization by removing benzene from a paraffin stream via hydrogenation and then using the high temperature generated by the exothermic hydrogenation to supply heat for hydroisomerization over a platinum on alumina catalyst. Coke removal by combustion is known. However, what applicants achieve is regeneration of the catalyst by coke removal and then the removal of the combustion byproducts ( $\text{CO}_2$  and  $\text{H}_2\text{O}$ ) by activation, which combine with the basic metal oxide to form carbonates and hydroxides) by using the activation procedure described in the specification, i.e., high temperature, long time duration, and use of an inert gas (e.g., nitrogen) with ultra low oxygen content. Regeneration and activation are two entirely different steps. The regeneration step of oxidizing the coke deposits generates  $\text{CO}_2$  which forms acid sites and is therefore a catalyst poison. Subsequent activation removes traces of  $\text{CO}_2$  to eliminate acid sites. The impact that this has in terms of increasing catalyst life is

nowhere suggested by the prior art, nor does the calcining procedure disclosed in the prior art achieve the results obtained by applicants' catalyst preparation process and composition.

Didillon employs a process using a halogen to decoke a metal catalyst (such as platinum, palladium, ruthenium, rhodium, osmium, iridium or nickel) on a refractory oxide support. Magnesium oxide is disclosed as a catalyst support, not a catalyst. The Didillon catalyst is for dehydrogenation or dehydrocyclization, not double bond isomerization. There is no reason why one skilled in the art would select a regeneration method for an entirely different catalyst to decoke a magnesium oxide double bond isomerization catalyst. The fact that Didillon employs a halogen-containing gas is inconsistent with the objective of the present invention to reduce the number of acid sites in the basic metal oxide which are prone to coking.

Accordingly, reconsideration and withdrawal of the rejection of Claims 8 and 9 under 35 U.S.C. §103(a) as being obvious over Lowery et al. '103, Schaub, Low and Didillon are respectfully requested.

#### The New Claims

New Claims 24 and 25 are added herein. Claim 24 depends from independent Claim 1 and further recites specifics of the activation conditions. Claim 25 is an independent claim

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directed to a catalyst composition for double bond isomerization . These claims are submitted to be even further distinguishable over the cited prior art patents.

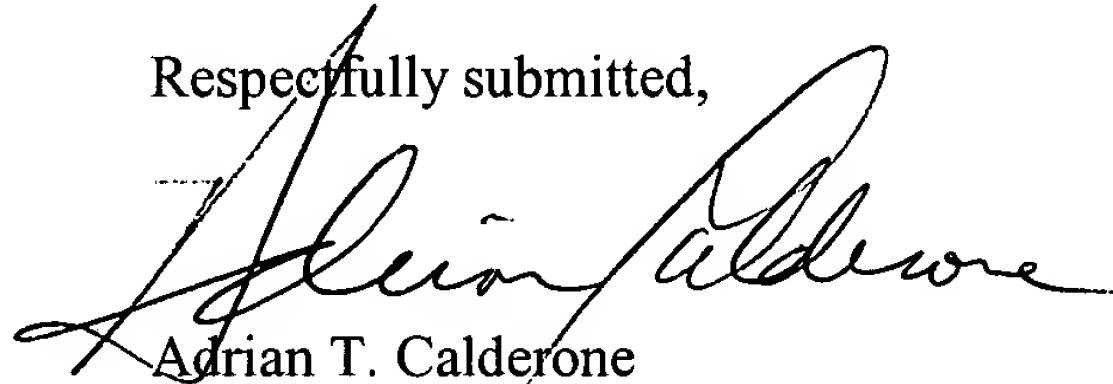
The Cancelled Claims

Claims 13-21 are cancelled without prejudice pursuant to a restriction requirement.

CONCLUSION

For at least the reasons stated above, all of the pending claims are submitted to be patentable and are in condition for allowance, the same being respectfully solicited.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Adrian T. Calderone', is written over a horizontal line.

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